COUNTY COUNCIL

OF

TALBOT COUNTY

2013 Legislative Session, Legislative Day No.: December 17, 2013

Resolution No.: 209

Introduced by: Mr. Bartlett, Mr. Duncan, Mr. Hollis, Mr. Pack, Ms Price

A RESOLUTION TO AMEND THE TALBOT COUNTY COMPREHENSIVE WATER AND SEWER PLAN TO PROVIDE PERMANENT ALLOCATION OF WASTEWATER CAPACITY WITHIN THE TALBOT COUNTY REGION II WASTEWATER TREATMENT SYSTEM ("REGION II SYSTEM") TO THE MARTINGHAM SEWER SERVICE AREA ("SSA") AND TO INCREASE EXISTING FLOWS WITHIN THE REGION II SYSTEM FROM MARTINGHAM SSA BY 40,500 GALLONS PER DAY

By the Council: December 17, 2013

Introduced, read the first time, and ordered posted, with Public Hearing scheduled on Tuesday, January 28, 2014 at 6:30 p.m. in the Bradley Meeting Room, South Wing, Talbot County Courthouse, Council Meeting Room, 11 North Washington Street, Easton, Maryland.

By order: Susan W. Moran

Susan W. Moran, Secretary

A RESOLUTION TO AMEND THE TALBOT COUNTY COMPREHENSIVE WATER AND SEWER PLAN TO PROVIDE PERMANENT ALLOCATION OF WASTEWATER CAPACITY WITHIN THE TALBOT COUNTY REGION II WASTEWATER TREATMENT SYSTEM ("REGION II SYSTEM") TO THE MARTINGHAM SEWER SERVICE AREA ("SSA") AND TO INCREASE EXISTING FLOWS WITHIN THE REGION II SYSTEM FROM MARTINGHAM SSA BY 40,500 GALLONS PER DAY

WHEREAS, the County Council of Talbot County, State of Maryland, by Resolution Number 100 has adopted the October 2002 Report of the Review of the Comprehensive Water and Sewerage Plan (the "Plan"); and

WHEREAS, Chapter Two of the Plan contains the *Talbot County Region II – Sanitary District Allocation Program,* pages 47-50F, which presents a detailed analysis of allocation of wastewater treatment capacity within the Region II (St. Michaels) Wastewater Treatment System ("Region II System"), including classifying allocation to the Martingham Sewer Service Area ("SSA") as "temporary"; and

WHEREAS, the County desires to change the allocation of wastewater capacity within the Region II System to the Martingham SSA from "temporary" to "permanent," which would increase the existing flows within the Region II System by 40,500 gallons per day ("gpd").

NOW, THEREFORE, BE IT RESOLVED BY THE COUNTY COUNCIL OF TALBOT COUNTY, that

1. In accordance with the requirements of Environment Article § 9-506(a)(1), Md. Ann. Code, the proposed amendment will be submitted to the Talbot County Planning Commission and the Talbot County Public Works Advisory Board for review and comment, within a 30 day period, for consistency with planning programs for the County. Pursuant to the requirements set forth in the above State statute, before the County Council may adopt the proposed amendment the Talbot County Planning Commission must first certify that the amendment is consistent with the County Comprehensive Plan prepared under Article 25A, §5 (X), Md. Ann. Code. Upon conclusion of the public hearing(s), closing of the public record, receipt and consideration of certifications and recommendations from the Planning Commission and Public Works Advisory Board, the County Council will consider and act upon the proposed amendment and approve Findings of Fact and Conclusions of Law.

2. Adoption of this resolution shall authorize the amendment of Chapter Two of the Talbot County Comprehensive Water and Sewerage Plan, *Talbot County Region II – Sanitary District Allocation Program*, pages 47-50F, for permanent allocation of wastewater capacity within the Region II (St. Michaels) Wastewater Treatment Plant to the Martingham SSA. Chapter Two shall reflect an increase in existing flows within the Region II System from Martingham SSA in the amount of 40,500 gpd pursuant to calculations by the County Engineer. To offset this increase, Chapter Two shall include new provisions reducing future Region II System flows from St. Michaels SSA by 40,500 gpd.

3. The text of this Amendment to Chapter Two of the Talbot County Comprehensive Water and Sewerage Plan is attached to this resolution as Exhibit "A" and incorporated by reference herein.

BE IT FURTHER RESOLVED, that this Resolution shall take effect immediately upon its date of passage.

PUBLIC HEARING

Having been posted and Notice, Time and Place of Hearing, and Title of Resolution No. _____ having been published, a public hearing was held on _____, 2014 in the Bradley Meeting Room, South Wing, Talbot County Courthouse, 11 North Washington Street, Easton, Maryland.

BY THE COUNCIL

Read the second time:

Enacted: _____

By Order: _____
Secretary

Pack -

Hollis -

Bartlett -

Price -

Duncan -

TALBOT COUNTY REGION II - SANITARY DISTRICT ALLOCATION PROGRAM

Background

The 2002 Report of the Review for the Talbot County Comprehensive Water and Sewerage Plan incorporated a detailed analysis to support the planning, design and construction of a 1.0 million gallon per day (MGD) wastewater treatment plant to replace the existing Region II Wastewater Treatment Plant with a design capacity of 500,000 gallon per day. Through negotiations with the Maryland Departments of the Environment (MDE) and Planning (MDP), the County and the - State agreed that the 1.0 million gallon per day (MGD) facility should be constructed, but the National Pollution Discharge Elimination System (NPDES) Permit would only allow the discharge of 800,000 gallons per day (gpd). The proposed wastewater treatment plant would be capable of enhanced nutrient removal, and would be capable of discharging concentrations of 3.0 mg/l of total nitrogen and 0.3 mg/l of total phosphorus at temperature of 10°C or greater to the receiving stream, Miles River.

After seeking approval from MDE and MDP as to the design capacity of the Region II Wastewater Treatment Plant, Talbot County sought engineering proposals for design services for the new 1.0 MGD Enhanced Nutrient Removal (ENR) Upgrade and Expansion of the Region II Wastewater Treatment Plant. The County selected Rummel, Klepper and Kahl (RK&K) through a competitive bidding process to design the new ENR Wastewater Treatment Plant.

During the design process, the County and RK&K sought ways to maximize the operation of the new 1.0 MGD ENR Upgrade and Expansion of the Region II Wastewater Treatment Plant. To provide temporary storage of extraneous flows experienced during periods of wet weather, the Bardnepho process would be constructed with two trains, each train capable of treating 500,000 gpd. In addition to the two train process, a flow equalization basin was incorporated into the new wastewater treatment plant with a capacity of 100,000 gallons. The flow equalization basin would be connected to one of the treatment trains providing the County with 600,000 gallons of storage of extraneous flow in addition to the 1.7 million gallon pond used for emergency storage and volume for shellfish protection as required within the NPDES Permit.

During the initial operation of the new Region II Wastewater Treatment Plant, flows would be treated through one train while efforts during this period would be made to improve the sewer collection system. As improvements were being made to the sewer collection system, thus creating capacity at the Region II Wastewater Treatment Plant, new opportunities to extend sewer into areas served by onsite sewage disposal systems would be created. Based on the information provided in the 1992 Update of the Talbot County Comprehensive Water and Sewerage Plan, the soils west of Route 50 are poor draining, clay laden soils, thus requiring groundwater penetration for effluent disposal for onsite sewage disposal systems. Utilizing the restricted, denied access sewer service policy that was adopted for the villages of Unionville, Tunis Mills and Copperville, the County could utilize the capacity reserved for inflow and infiltration for addressing water quality problems associated with septic systems thus establishing a program for protecting the tributaries of the Chesapeake Bay and promoting improvements of water quality of the tributaries in Talbot County.

As the design of the 1.0 MGD facility was being completed, MDE requested that the County execute the ENR agreement to proceed with the funding of the project using ENR grant funds and State Revolving Funds for low-interest loans. The ENR agreement was forwarded to the County Council President for execution, however, due to public concern as to the design and construction of a 1.0 MGD wastewater treatment facility to be permitted for 0.8 MGD, the County Council sought information from the Department of Public Works and input from the general public. During this period, the Region II Wastewater Treatment System experienced problems with extraneous flows associated with groundwater and stormwater entering the sewer collection system.

These extraneous flows are defined as inflow and infiltration (I&I) flows. As the County was attempting to complete the design of the ENR upgrade and expansion of the Region II Wastewater Treatment Plant, the County was also completing in-pipe flow monitoring and smoke testing of the gravity sewer collection system in the Town of St. Michaels and the communities of Rio Vista and Bentley Hay. Through analysis by the Department of Public Works, the amount of I&I flows entering the Region II Wastewater Treatment Plant was fairly consistent with the difference in the daily average flows recorded for calendar year 2002 and 2003. In 2002, the Mid-Atlantic Region of the United States experienced a serious drought and flows at the Region II Wastewater Treatment Plant averaged 298,000 gpd. In 2003, the Eastern Shore and the State of Maryland experienced record snowfalls and rainfalls that resulted in a yearly daily average flow of 486,000 gpd being recorded at the Region II Wastewater Treatment Plant. Using the difference in the yearly daily average flows for calendar year 2002 and 2003, the estimated amount of I&I entering the Region II Wastewater Treatment Plant is 170,000 gpd.

Revised Design Capacity from 1.0 MGD to 0.660 MGD

As concerns from the general public mounted concerning the 1.0 MGD plant, permitted for 0.8 MGD and on-going problems with the sewer collection system, the County Council introduced and adopted Resolution 106 to authorize the design and construction of a ENR wastewater treatment plant with a design capacity of 0.660 MGD.

With the adoption of Resolution 106, a conflict resulted within the Talbot County Comprehensive Water and Sewerage Plan associated with the analysis in Chapter 2 supporting the design and construction of a 1.0 MGD facility to be permitted for 0.8 MGD and the decision of the County Council to design and construct a 0.660 MGD ENR Wastewater Treatment Plant. Because of this conflict, MDE and MDP requested that Talbot County complete a new analysis to determine the allocation of capacity of the Region II Wastewater Treatment Plant to the various areas served by the treatment facility. In 2004, DPW completed the analysis and worked with the County Council to adopt the revised sewer allocations for the Region II Wastewater Treatment Plant having a designed hydraulic capacity of 660,000 gpd.

Between 2004 and 2012, the Region II Wastewater Treatment System was upgraded with Enhanced Nutrient Removal (ENR) technologies and parts of the gravity sewer collection system throughout the Town of St. Michaels have been rehabilitated or replaced to help reduce the extraneous flows. In addition to these improvements, the Town of St. Michaels and the County

have revised their overall growth strategies with the Town and the County reviewing ways to comply with the Total Maximum Daily Load (TMDLs) requirements.

As part of the TMDLs, Counties are required to prepare Watershed Implementation Plans that identify ways to reduce pollution from both point and non-point sources. With this new environmental focus, Talbot County has reviewed the existing flow allocations for each sewer service area as developed in the 2004 analysis. Using this analysis, the County has reviewed the future flow requirements for the existing sewer service areas and the Town of St. Michaels. In reviewing the future flows for each sewer service area, the number of existing infill lots was estimated for each area.

The estimated number of infill lots for the Town of St. Michaels was developed using the County Geographical Information System software. The total estimated number of infill lots in the Town totaled 91 residential lots and two (2) commercial lots. Within the villages of Royal Oak, Newcomb and Bellevue, the total number of infill lots were estimated to be 99 residential lots. As for the villages of Unionville, Tunis Mills and Copperville, the total number of infill lots was estimated to be five (5) lots.

Using the 2004 analysis of flows that estimated the existing flows, the future flows and the inflow and infiltration flows, the analysis herein reallocates part of the future flows to other areas which are just outside the existing sewer service areas and to villages having a documented history failing septic systems. For reference purposes only, Table 1 lists each sewer service area and the estimated existing flows, future flows and an allocation for inflow and infiltration that was incorporated into the Comprehensive Water and Sewerage Plan in 2004 via Resolution 122.

Table 1 Allocation of Capacity at the Region II Wastewater Treatment Plant in gallons per day

SEWER SERVICE AREA	EXISTING FLOWS (gpd)	FUTURE FLOWS (gpd)	RESERVED CAPACITY FOR I&I (gpd)	TOTAL FLOWS (gpd)
St. Michaels	133950	109700	*143500*	387150
Rio Vista Area	63050	6400	*0*	69450
Bentley Hay	29800	0	*0*	29800
Unionville, Tunis Mills and Copperville	21100	5900	*5400*	32400
Royal Oak, Newcomb and Bellevue	47100	58000	*21100*	126200
Other County Areas	3000	12000	*0*	15000
Inflow and Infiltration Reserved Capacity	170000	0	*0*	0
Totals	468000	192000	*170000*	660000

As presented in the 2004 analysis, the information herein uses the calculated flows for each sewer service area to develop the revised allocation of the capacity of the Region II Wastewater Treatment Plant. In summary, the future flow allocations presented in 2004 have been reallocated to other areas within the County as part of Watershed Implementation Plan to improve water quality within streams impacted by septic systems that penetrate the groundwater.

Determination of Wastewater Flow from the Villages, Communities, and Other Areas
In the 2002 Report of the Review, the analysis used principles from the MDE guidelines for determining water generation from a residential structure with the assumption that the wastewater generation equaled the water generation. Typically wastewater generation is a percentage of water generation due to water being used for lawns, to wash cars or fill pools thus resulting in water being used but is not being discharged into the sewer system. In accordance with the MDE guidelines, flow projections for wastewater less than 80 gallons per day (gpd) per person must be justified. Metering the wastewater flow for over 17 months and reviewing the data, the metered data is consistent and provides justification for using a flow projection less than 80 gpd per person or 184 gallons per equivalent dwelling per day. For areas within the Town of St. Michaels that are served by a gravity sewer system, the allocation of wastewater flow per dwelling shall be 250 gpd per dwelling. This flow rate uses a population equivalent of 2.3 people per dwelling with an estimated wastewater generation of 80 gpd per person which totals 184 gpd per dwelling. To help account for inflow and infiltration 66 gpd is added to the flow rate calculated for the dwelling to establish a flow rate of 250 gpd per dwelling (184 gpd/dwelling + 66 gpd of I&I/dwelling).

In an attempt to accurately assess the wastewater generation for the villages of Unionville, Tunis Mills, Copperville, Royal Oak, Newcomb, and Bellevue, the wastewater flows were metered at the Unionville Pump Station serving the villages of Unionville, Tunis Mills and Copperville and Royal Oak Pump Station. The Royal Oak Pump station receives wastewater flows from the villages of Bellevue, Newcomb and Royal Oak as well as the flows from the Unionville Pump Station. The recorded flows from January, 2003 through May, 2004 are listed in Table 2.

Table 2 - Pump Station Flow Data

MONTH	Royal Oak Pump Station No. 1 (gallons per day)	Unionville Pump Station Unionville, Tunis Mills and Copperville Flows (gallons per day)	Royal Oak, Newcomb, and Bellevue Flows (gallons per day)
January, 2003	64,000	22,000	42,000
February, 2003	80,000	28,000	52,000
March, 2003	77,000	25,000	52,000
April, 2003	65,000	20,000	45,000
May, 2003	68,000	20,000	48,000
June, 2003	74,000	22,000	52,000
July, 2003	66,000	19,000	47,000
August, 2003	67,000	20,000	47,000
September, 2003	74,000	20,000	54,000
October, 2003	68,000	19,000	49,000
November, 2003	71,000	23,000	48,000
December, 2003	68,000	22,000	46,000
January, 2004	61,000	21,000	40,000
February, 2004	65,000	20,000	45,000
March, 2004	64,000	17,000	47,000

April, 2004	68,000	20,000	48,000
May, 2004	56,000	20,000	36,000

Using the data provided in Table 2, the daily average flows were calculated as follows:

Unionville, Tunis Mills and Copperville

Calendar Year 2003 Daily Average Flow:	21,700 gallons per day
Calendar Year 2004 Daily Average Flow:	19,600 gallons per day
2003/2004 (Jan – May) Daily Average Flow:	21,100 gallons per day

Royal Oak, Newcomb and Bellevue

Calendar Year 2003 Daily Average Flow:	48,400 gallons per day
Calendar Year 2004 Daily Average Flow:	43,800 gallons per day
2003/2004 (Jan – May) Daily Average Flow:	47,100 gallons per day

Unionville, Tunis Mills and Copperville

Within the Region I - Unionville, Tunis Mills and Copperville Sewer Service Area, 175 residential structures, as reported in 2004, are connected to the sewer system with a daily average flow of 21,100 gpd, reported from January 2003 to May 2004. Based on Fiscal Year (FY) 2011, 170 residential structures were being billed for sewer service, but the 2004 analysis will be used since the five (5) residential structures still exist but are not occupied. Approximately 48 lots can be connected in the future. To assess the future flows from the proposed 48 lots, the daily average flow of 21,100 gpd was divided by the existing number of residential structures connected to the sewer system to establish a flow per connection. The flow per connections was calculated to be 121 gpd per connection. To calculate the future flow rate of 48 lots, or future connections, 48 lots were multiplied by 121 gpd per connection, with the future flow being estimated to be 5,900 gpd in 2004. In 2010, one property was subdivided into two (2) lots with Carroll's Market being connected to the force main that runs between the Royal Oak Pump Station in the village of Newcomb and the Unionville Pump Station. With an estimated increase in flow from Carroll's Market of 600 gpd the existing flow was increased to 21,700 gpd, and the future flow were increased to 6,150 gpd adding the two new lots.

Because of various unknowns such as missing and/or broken cleanout caps, broken laterals, leaking tank seals and/or leaking tank lids, a safety factor was used. Consistent with EPA and MDE guidelines, a safety factor of 20% was used to estimate the flow allocation for this region, and this safety factor addresses the variability of wastewater flows for small systems. In the final reporting of the wastewater flows for this sewer service area (27,950 gpd), the safety factor will be incorporated within the I&I flows. Future flows beyond 6,250 gpd will be reviewed and granted on an as-needed basis by the County Council as part of a Resolution to amend the Comprehensive Water and Sewerage Plan. The following outlines how the flow allocation for Region I Unionville, Tunis Mills and Copperville Sewer Service Area, of 32,400 gpd, was determined.

Estimated Total Flow (Q)	=	Existing Flow ($Q_{existing}$)	+	Future Flows (Q_{future})	+	20% Safety Factor
33,550 gpd	=	21,700 gpd	+	6,250 gpd	+	5,600 gpd

Royal Oak, Newcomb and Bellevue

Within the Region II - Royal Oak, Newcomb and Bellevue Sewer Service Area, 376 residential structures, as reported in 2004, are connected to the sewer system with a daily average flow of 47,100 gpd as recorded for the past 17 months. Approximately 99 existing lots of record can be connected in the future. To assess the future flows from the proposed 99 lots and a ten (10) percent increase in the existing number of residential structures (37 equivalent dwelling units), the daily average flow of 47,100 gpd was divided by the existing number of residential structures connected to the sewer system to establish a flow per connection. The flow per connection was calculated to be 126 gpd per connection. To calculate the future flow rate of 136 lots, or future connections, 136 lots were multiplied by 126 gpd per connection, with the future flow being estimated to be 17,200 gpd. As per FY2011 billing records, 377 residential structures are being billed for sewer service, so the 2004 analysis will be used.

Because of various unknowns such as missing and/or broken cleanout caps, broken laterals, leaking tank seals and/or leaking tank lids, a safety factor was used. Consistent with EPA and MDE guidelines, a safety factor of 20% was used to estimate the flow allocation for this region, and this safety factor addresses the variability of wastewater flows for small systems. In the final reporting the wastewater flows for this sewer service area (64,300 gpd), the safety factor will be incorporated within I&I flows. The following outlines how the flow allocation for the Region II Royal Oak, Newcomb and Bellevue Sewer Service Area, of 77,200 gpd, was determined.

Estimated Total Flow (Q) = Existing Flow ($Q_{existing}$) + Future Flows (Q_{future}) + 20% Safety Factor

77,200 gpd = 47,100 gpd + 17,200 gpd + 12,900 gpd

Community of Bentley Hay

In completing the 2002 Report of the Review of the Talbot County Comprehensive Water and Sewerage Plan, the Department of Public Works learned that the subdivision of Bentley Hay was excluded from the Priority Funding Area maps for the state and the County. The subdivision of Bentley Hay is outside the municipal boundary of the Town of St. Michaels, yet receives water service from the Town of St. Michaels, and receives sewer service from Talbot County via the Region II Wastewater Treatment Plant.

The Subdivision of Bentley Hay dates back to 1947 and has been assumed to be built out as of this date. The projected sanitary sewer flow from this subdivision was estimated to be 29,800 gallons per day that was reported in the Region II Wastewater Treatment Plant Allocation Program in the 2002 Report of the Review.

The allocation as presented in the 2002 Report of the Review shall be the same within the revised allocation. The Bentley Hay community allocation shall be 29,800 gpd.

Other County Areas

As presented in the 2002 Report of the Review, flows from various areas in the County were incorporated into the allocation program. These areas included Chester Park, areas outside the priority funding areas and properties within the priority funding areas identified by the Maryland

Department of Planning (MDP). In addition to the areas in the County, estimated flows from the Perry Cabin Inn were incorporated into the flow calculations.

With the completion of the expansion of the Inn at Perry Cabin, the estimated flow of 8,000 gpd has been assumed to be part of the existing flows for the Town of St. Michaels and Rio Vista. With the reduced capacity of the Region II Wastewater Treatment Plant, estimated wastewater flows from the Community of Back Creek and Chester Park have been incorporated into the category of Other County Areas with an estimated existing flow of 3,000 gpd and 3,000 gpd for future flows. The areas allocated wastewater flow in the 2002 Report of the Review, Unincorporated Areas being identified by MDP as being priority funding areas shall be incorporated into the future flows and made part of the reserved capacity for I&I flows for the Town of St. Michaels and Rio Vista as presented in this analysis. Both the County and the Town of St. Michaels will have to determine how future areas will be served with the capacity identified for future flows and the flows associated with the reserved capacity to I&I flows.

Town of St. Michaels and Rio Vista

Within this analysis, the existing flows for St. Michaels and Rio Vista were determined by deducting the recorded and estimated flows for other areas and the extraneous flows associated with I&I flows. The estimated existing flow of 197,000 gallons per day was determined for St. Michaels and Rio Vista. To estimate the future flows from the Town of St. Michaels and Rio Vista, I&I flows were held constant establishing a reserved capacity for existing and future extraneous flows. The safety factors for Unionville, Tunis Mills and Copperville and Royal Oak, Newcomb and Bellevue Sewer Service Areas were incorporated as part of extraneous flows held constant as reserved capacity.

In 2004, the estimated future flows for the Town of St. Michaels and Rio Vista was estimated to be 116,100 gpd, or 109,700 gpd for the Town of St. Michaels and 6,400 gpd for Rio Vista. The future flows were intended to serve existing lots of record, infill lots, and several subdivisions that were being planned at the time the analysis was being completed in 2004. In 2012, there were approximately 93 existing lots of record within the Town, with 76 of these lots having a total acreage of 56.67 acres. The average lot size of the 76 existing lots of record is 1.34 acres. The remaining 17 lots consist of 16 lots related to the Maria subdivision and one (1) lot related to the Miles Point Property.

Assuming that these lots will be connected via a gravity sewer line, the flow per lot was estimated to be 250 gpd/EDU. With two (2) properties being on Maryland Route 33 (St. Michaels Road), these two (2) properties were allocated 750 gpd per property for future commercial flows, the estimated flow from these infill lots was calculated to be 24,250 gpd ([93 lots + 4 EDUs for commercial flows) X 250 gpd/EDU).

To address unforeseen flows related to business expansion or new lots within the Town of St. Michaels, an additional 5% of capacity was reserved for the Town using the estimated existing flow of 197,000 gpd, thus 10,000 gpd was estimated for unforeseen future flows. These unforeseen future flows added to the flows for infill lots (24,250 gpd) establishes a future flow allocation to the Town of St. Michaels or 34,250 gpd.

Community of Rio Vista

After completing the analysis to determine the existing and future flows for St. Michaels and Rio Vista, an estimate of the wastewater flows being generated by Rio Vista was completed. The Rio Vista Community has 264 residential lots with a church owning 16 of this these lots. Incorporated into the Rio Vista flows are the lots along Maryland Route 33 with approximately 65.25 equivalent dwelling units (EDUs) with a future total 97.25 EDUs. Using 200 gallons per day per residential lot, the estimated wastewater flow for Rio Vista area was determined to be 63,050 gallons per day with 49,600 gpd associated with 248 residential lots in the Rio Vista Community, 400 gallons per day of wastewater flow being estimated for the church, and 13,050 gpd being allocated for the businesses on Maryland Route 33. The future flows for this area were estimated to be 6,400 gpd with the assumption that Rio Vista was built-out, thus establishing a total allocation of 67,450 gpd for this area.

Inflow and Infiltration Flows and Reserved Capacity

Using calendar year 2003 flow data for the Region II Wastewater Treatment Plant and the design capacity of 500,000 gpd, the allocations for the various sewer service areas are provided in Table 2. Based on the amount of extraneous, I&I flows experienced in calendar year 2003 being 170,000 gpd, this value has been shown in Table 2 as I&I flows. Because of the extraneous flows currently being recorded at the Region II Wastewater Treatment Plant, measures need to be taken to reserve this capacity to avoid over allocating the existing and future capacity of the plant.

The estimated flow being reserved for I&I is 170,000 gpd. The 170,000 gpd is primarily associated with the extraneous flows experienced in the gravity sewer collection system within Town of St. Michaels and the communities of Bentley Hay and Rio Vista but impacts the overall capacity of the Region II Wastewater Treatment Plant. By reserving capacity for the extraneous, I&I flows, this capacity will buffer peak flows associated with future extraneous, I&I flows allowing the Region II Wastewater Treatment Plant to be operated within the permit limitations for capacity. As improvements to the gravity sewer system are completed, the flows recorded at the Region II Wastewater Treatment Plant, recorded through in-pipe flow monitoring and computer analysis can be used to determine how much capacity can be removed from the reserved capacity set aside for I&I flows.

The 170,000 gpd allocated for I&I flows (or the wastewater treatment plant safety factor) equates to approximately 26% of the design capacity. The use of a 20% safety factor for the village flows is associated with variability of small flows and was not intended to reflect additional reserve capacity within the wastewater treatment plant. As future efforts are made to reduce extraneous flows entering the St. Michaels Gravity Sewer Collection System, capacity within the Region II Wastewater Treatment Plant can be reallocated from the reserve and used to address sewer needs and water quality improvements.

Table 2 Existing Wastewater Flows to the Region II Treatment Plant

SEWER SERVICE AREA	EXISTING FLOWS
Existing Design Capacity	500000
Recorded Flows for Calendar Year 2003	-468000
Remaining Capacity	**32000**
REVIEW OF EXISTING FLOWS	
Total for the Region II Wastewater Treatment Plant	468000
Bentley Hay	-29800
Unionville, Tunis Mills and Copperville	-21100
Royal Oak, Newcomb and Bellevue	-47100
Other County Areas	-3000
Inflow and Infiltration Flow	-170000
St. Michaels And Rio Vista	**197000**

As presented in Table 2, the existing flows for the Town of St. Michaels and Rio Vista equates to 197,000 gpd with 133,950 gpd being estimated for the Town of St. Michaels and 63,050 gpd being estimated for the Rio Vista area. Using the flows presented earlier in the analysis, the projected flows for new wastewater treatment plant with a capacity of 660,000 gpd has been presented in Table 3.

Table 3 Allocation of Capacity at the Region II Wastewater Treatment Plant

SEWER SERVICE AREA	EXISTING FLOWS	FUTURE FLOWS	TOTAL FLOWS
St. Michaels	133950	109700	243650
Rio Vista Area	63050	6400	69450
Bentley Hay	29800	0	29800
Unionville, Tunis Mills and Copperville	21100	5900	27000
Royal Oak, Newcomb and Bellevue	47100	17550	64650
Other County Areas	3000	3000	6000
Inflow and Infiltration Reserved Capacity	170000	0	170000
Totals	468600	142550	535700

In comparison with the 2002 Report of the Review, the existing and future flows for the Town of St. Michaels and the Rio Vista were reduced from 544,000 gpd to 313,100 gpd. The wastewater flow allocation for the Town of St. Michaels can be increased as sewer collection system improvements are made and confirmed by the Department of Public Works to have actually reduced the amount of I&I flow into the sewer collection system.

Community of Martingham and Harbourtowne Golf Resort and Conference Center

In April, 2004, representatives from Martingham Utilities Cooperative met with the Talbot County Department of Public Works to discuss the possibility of connecting to the Region II Wastewater Treatment Plant. The current wastewater treatment system serving the residents of the Martingham Community and the Harbourtowne Golf Resort and Conference Center consists of a two-stage stabilization lagoon followed by disinfection and an effluent holding pond. Under proper weather conditions, the treated effluent is spray irrigated on various fairways.

The wastewater treatment facility for the Martingham Community has a treatment plant capacity of 75,000 gpd but the spray disposal areas had a permit limit of 66,800 gpd. The Martingham Community serves 330 residents and a commercial establishment, the Harbourtowne Golf Resort and Conference Center.

Based on information received back in 2004 from Martingham Utilities Cooperative, MDE, and Maryland Environmental Service, the contract-operator for the Martingham Wastewater Treatment Plant at the time, the spray irrigation site on private land had been reduce by nearly 65% of the usable land area due to MDE requiring a 200 foot setback. It was concluded that the only option available to Martingham Utilities was to send flow to the Region II Wastewater Treatment Plant, especially during periods of dry weather in the late fall and winter months to establish enough pond capacity to retain water in the ponds when Martingham cannot spray irrigate.

Based on the discussions with Martingham Utilities Cooperative back in 2004, up to 8,000,000 gallons of either raw wastewater or treated effluent would need to be sent to the Region II Wastewater Treatment Plant. During years with normal precipitation amounts, an estimated 2,000,000 to 4,000,000 gallons of flow would be sent to the Region II Wastewater Treatment. In the event of an extremely wet year, 8,000,000 gallons would be sent to the Region II Wastewater Treatment Plant over a period of 300 days (26,667 gpd).

For the County to participate with Martingham Utilities Cooperative and MDE in resolving this issue, corrective measures that involve the Region II Wastewater Treatment Plant and Sewer Collection System needed to be completed in two phases. First, a short-term strategy would employ a temporary force main laid within the road drainage ditches or other approved temporary strategy conveying treated effluent to the Region II Wastewater Treatment Plant. The standard operating procedure, in the short-term, would need to limit the amount of treated effluent to 19,000 gpd or less on a calendar year daily average flow with no flow being conveyed during periods of rainfall. During this short-term, temporary period, improvements to the sewer collection system would occur, and the County believed that improvements to the sewer lines in areas around Mill and Carpenter Streets, and the north end of Town would reduce enough I&I flows from the system to allow Martingham to connect to the Region II Sewer Collection System on a permanent basis.

In 2008, the Talbot County Sanitary District assumed ownership of the Martingham Wastewater Treatment System. After assuming ownership of this wastewater system, the County pursued a long-term strategy of constructing a new force main from the Martingham Wastewater Treatment Plant to the sewer collection system of the Region II Wastewater Treatment Plant. To complete this long-term strategy, the Talbot County Sanitary District applied for low-interest loans and a grant through the USDA Rural Utility Service program in 2010. Due to limited grant funds being offered to the extend the sewer to the Martingham Community, Talbot County submitted a grant request to the Maryland Water Quality Infrastructure Financing Program administered by MDE in 2012 seeking up to $2.0 million in grant funds or loan forgiveness.

Because of the low-strength of the raw wastewater being treated at the Region II Wastewater Treatment, raw sewage from the Martingham Wastewater Treatment Plant should be pumped for treatment at the Region II Wastewater Treatment Facility. In reviewing the metered flows at the Martingham Wastewater System, an average flow per EDU was determined to be 122.5 gpd/EDU. As previously mentioned, the Martingham Community consists of 330 EDUs which consists of residential structures and the Harbourtowne Golf Resort and Conference Center. In reviewing the number to residential lots and commercial lots between Marthingham and the Region II Sewer Collection System, 55 EDUs exist on Deep Water Point Road and Yacht Club Road. The proposed allocation for the Martingham area consists of the 330 EDUs, 4 undeveloped lots, a possible expansion of the Golf Resort and Conference Center and the 55 EDUs on Deep Water Point and Yacht Club Roads which totals 409 EDUs. This would establish a total wastewater allocation to Martingham of 50,200 gpd. At this time, it will be assumed that the existing flows total 330 EDUs or 40,500 gpd with the future wastewater flows being 9,700 gpd with only 8,950 gpd being allocated at this time.

The revised flow allocation for the existing flows to the Region II Wastewater Treatment Plant with a design capacity of 660,000 gpd has been presented in Table 4. In developing the existing flows, the reported flows are estimates which will fluctuate due to various factors with the most influential factor being wet weather. To avoid an over-allocation of wastewater treatment capacity, 170,000 gpd, as reported in the 2002 Report of the Review and the revised Talbot County – Region II Sanitary District Allocation Program dated August 11, 2004, has been used to reserve capacity during wet weather events. The Department of Public Works continues to complete improvements within the sewer collection system, but there is very little data to accurate estimate a reduction in estimated I&I allocated flows.

Table 4 Review of Allocation of Capacity for Existing Flows with 170,000 gpd of I&I

SEWER SERVICE AREA	EXISTING FLOWS
St. Michaels and Rio Vista	197000
Bentley Hay	29800
Unionville, Tunis Mills and Copperville	21100
Royal Oak, Newcomb and Bellevue	47100
Other County Areas	3000
Martingham Community	40500
Subtotal Existing Flows – Estimated	338500
Inflow and Infiltration	*170000*
Totals	508500

As discussed earlier, each area was allocated additional capacity to address infill and future growth within businesses or expansion of sewer service areas. Table 5 lists the existing and future flow allocations for the areas presently served by the Region II Wastewater Treatment Plant. It should be noted that future flows from the Royal Oak, Newcomb and Bellevue Sewer Service Area was reduced and the Other County Areas in order to allocate capacity to the Martingham Community on a permanent basis. As part of Table 5, the future flows of all areas will be reviewed after a comprehensive review of zoning has been completed.

In the future, an analysis will be completed to verify the flows after sewer has been extended to a new area to determine the actual flow allocation for the area. However, it should be noted that the calculation of flows to a new area could take between one (1) to five (5) years.

Table 5 Revised Allocation of Capacity for 660,000 gallons per day

SEWER SERVICE AREA	EXISTING FLOWS	FUTURE FLOWS	TOTAL FLOWS
St. Michaels	133950	109700	243650
Rio Vista	63050	6400	69450
Bentley Hay	29800	0	29800
Unionville, Tunis Mills and Copperville	21100	5900	27000
Royal Oak, Newcomb and Bellevue	47100	17550	64650
Other County Areas	3000	3000	6000
Martingham Community	40500	8950	49450
Subtotals	338500	151500	490000
I&I Flow Allocation – Estimated	170000	0	170000
Subtotals	508500	0	660000